REV. 06-28-19: ADDED GENERAL NOTE NO. (10). REVISED DESIGN NOTE NO. (F).

TABLE I MINIMUM DESIGN SPEEDS FOR LOW-VOLUME ROADS

TYPE OF TERRAIN	DESIGN SPEED (MPH) FOR SPECIFIED DESIGN ADT (VEH/DAY)			
	UNDER 50	50 TO 250	250 TO 400	400 TO 2,000
LEVEL	30	30	40	50
ROLLING	20(J)	30	30	40
MOUNTAINOUS	20(J)	20(J)	20(J)	30

TABLE II
DESIGN STANDARDS FOR LOW-VOLUME LOCAL ROADS AND STREETS (ADT ≤ 400)

DESIGN SPEED (MPH) (J)				15	20	25	30	35	40
PROPOSED APPROACH ROADWAY (FEET)	RURAL LOCAL ROADS			18	18	18	18	18	18
	RECREATIONAL AND SCENIC ROADS			18	18	18	18	18	20
	INDUSTRIAL/COMMERCIAL ACCESS			20	20	22	24	24	24
	URBAN LOCAL ROADS LOW DEVELOPMENT DENSITY (2.0 OR LESS DWELLINGS/ACRE)			20	20	20	20	20	20
	URBAN LOCAL ROADS MEDIUM DEVELOPMENT DENSITY (2.1 TO 6 DWELLINGS/ACRE)			28	28	28	28	28	28
MINIMUM HORIZONTAL CURVE RADIUS (FEET) BY SUPERELEVATION RATE	ALL CLASSIFICATIONS (G)	NC	-2%	50	107	198	333	510	762
			0%	47	99	181	300	454	667
		RC	2%	44	92	167	273	408	593
			3%	43	89	160	261	389	561
			4%	42	86	154	250	371	533
			5%	41	83	149	240	355	508
			6%	39	81	144	231	340	485
			7%	38	78	139	222	327	464
			8%	38	76	134	214	314	444
MINIMUM STOPPING SIGHT DISTANCE (FEET)	ADT 0 TO 100 (VEH/DAY)			65	90	115	135	170	215
	ADT 101 TO 400 (VEH/DAY)			65	95	125	165	205	250
MINIMUM " K " VALUES	CREST VERTICAL CURVE	ADT 0 TO 100 (VEH/DAY)		2	4	7	9	14	22
		ADT 101 TO 400 (VEH/DAY)		2	5	8	13	20	29
	SAG VERTICAL CURVE			10	17	26	37	49	64
MAXIMUM GRADE (%)	TYPE OF TERRAIN	LEVEL		9	8	7	7	7	7
		ROLLING		12	11	11	10	10	9
		MOUNTAINOUS		17	16	15	14	13	12

FOR SUPERELEVATION SEE STANDARD DRAWINGS RD11-SE SERIES (G)

DESIGN NOTES

(A) THE SLOPE OF THE SHOULDER AND THE ROADWAY PAVEMENT SHALL BE THE SAME IN ALL SITUATIONS.

(B) MAXIMUM 2(H):1(V) OR AS RECOMMENDED BY THE GEOTECHNICAL OFFICE. WHEN A 2(H):1(V) SLOPE IS USED, AND THE FILL HEIGHT EXCEEDS SIX FT., GUARDRAIL SHOULD BE CONSIDERED. WHERE RIGHT-OF-WAY IS NOT AN ISSUE, STANDARD DRAWING RD11-S-11 (CASE II) SLOPES MAY BE USED.

(C) SEE STANDARD DRAWING RD11-S-11A FOR ROUNDING OF ROADSIDE DITCH SLOPES.

(D) SEE STANDARD DRAWING S-PL-6 FOR TYPICAL GUARDRAIL PLACEMENT.

(E) SITE-SPECIFIC CONDITIONS AND ENGINEERING JUDGMENT OF THE DESIGNER SHOULD BE THE TWO PRIMARY DETERMINANTS OF THE APPROPRIATE CLEAR ZONE WIDTH FOR LOW-VOLUME LOCAL ROADS. AT LOCATIONS WHERE A CLEAR ZONE OF 6 FEET OR MORE IN WIDTH CAN BE PROVIDED AT LOW COST AND WITH MINIMUM SOCIAL/ENVIRONMENTAL IMPACT, SUCH CLEAR ZONE SHOULD BE CONSIDERED. WHERE PROVISION OF A CLEAR ZONE IS NOT PRACTICAL, NONE IS REQUIRED.

(F) FOR BRIDGE PROJECTS WHERE THE TOTAL APPROACH ROADWAY WIDTH (TRAVELED WAY PLUS SHOULDERS) IS SURFACED, THAT SURFACE WIDTH SHOULD BE CARRIED ACROSS THE STRUCTURE. THE WIDTH OF THE BRIDGE CANNOT BE LESS THAN THE PROPOSED ROADWAY WIDTH SELECTED FROM TABLE II. THE TOTAL APPROACH ROADWAY WIDTH CANNOT BE LESS THAN THE EXISTING ROADWAY WIDTH, AS DETERMINED ABOVE. HOWEVER, ON UNSURFACED RURAL ROADS, WITHOUT DEFINED TRAVELED WAY OR DEFINED SHOULDERS, THE WIDTH DETERMINED FROM TABLE 2 WILL SUFFICE.

(G) FOR THE DESIGN OF SUPERELEVATION TRANSITIONS, USE THE SUPERELEVATION DESIGN SPEED LISTED DIRECTLY ABOVE THE SELECTED MINIMUM HORIZONTAL CURVE RADIUS. FOR EXISTING ROADS WHERE SUPERELEVATION IS NOT PRESENT AND NO SITE-SPECIFIC SAFETY PROBLEM IS KNOWN, SUPERELEVATION MAY NOT BE NECESSARY. REMOVAL OF NORMAL CROWN BY SUPERELEVATING THE ENTIRE ROADWAY AT THE NORMAL CROSS SLOPE MAY BE USED UNLESS SUPERELEVATION IS NEEDED AS DETERMINED BY THE DESIGNER. THE DESIGNER SHOULD ASSESS THE PROJECT SITE AND USE ENGINEERING JUDGEMENT WHEN MAKING THIS DETERMINATION. FOR UNPAVED ROADS, REMOVAL OF NORMAL CROWN BY SUPERELEVATING THE ENTIRE ROADWAY AT THE NORMAL CROSS SLOPE MAY BE USED OR SUPERELEVATION MAY BE ELIMINATED.

(H) THESE STRUCTURES SHOULD BE ANALYZED INDIVIDUALLY, TAKING INTO CONSIDERATION THE CLEAR WIDTH PROVIDED, TRAFFIC VOLUMES, REMAINING LIFE OF THE STRUCTURE, PEDESTRIAN VOLUMES, SNOW STORAGE, DESIGN SPEED, ACCIDENT RECORD, AND OTHER PERTINENT FACTORS.

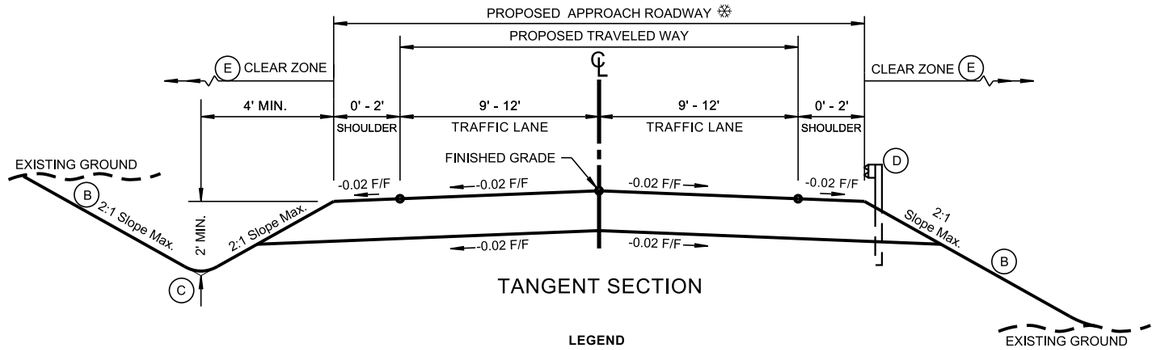
(I) CURB-TO-CURB OR BETWEEN RAILS, WHICHEVER IS THE LESSER.

(J) DESIGN SPEED SHOULD BE SELECTED BASED ON ACTUAL OR ANTICIPATED OPERATING SPEED AND CONDITIONS ON THE ROAD BEING DESIGNED.

(K) DESIGN LOADING: ALL NEW AND REHABILITATED BRIDGES SHALL BE DESIGNED FOR HL-93 LOADING.

(L) FOR NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS: THE MINIMUM CLEAR WIDTH FOR NEW BRIDGES SHALL BE EQUAL TO THE FULL WIDTH OF THE APPROACH ROADWAY (CURB-TO-CURB OR FULL SHOULDER WIDTH AS APPLICABLE). WIDTH SHOULD BE AVAILABLE FOR FARM EQUIPMENT USE AS REQUIRED.

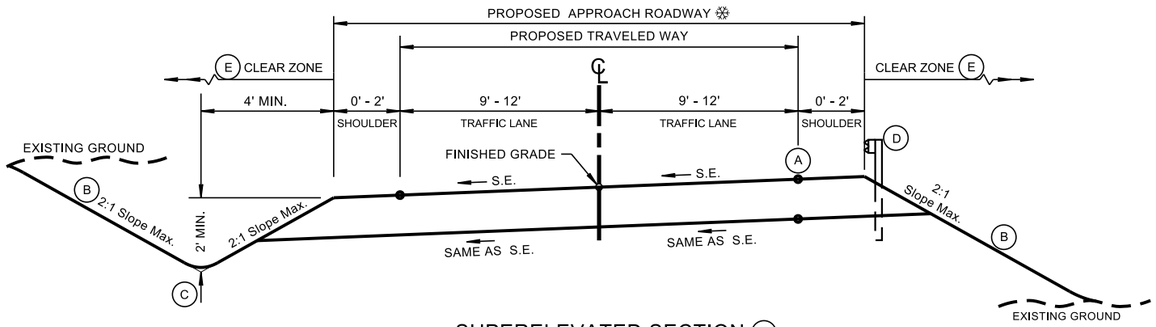
NOT TO SCALE



TANGENT SECTION

LEGEND

❁ SEE TABLE II FOR WIDTHS



SUPERELEVATED SECTION (G)

BRIDGE DESIGN - MINIMUM CLEAR WIDTHS AND DESIGN LOADINGS (K) (L)

DESIGN ADT (VEH/DAY)	MINIMUM CLEAR (A) WIDTH (FEET) (I)	DESIGN LOADING (STRUCTURAL CAPACITY) FOR NEW AND RECONSTRUCTED BRIDGES	(F) DESIGN LOADING (STRUCTURAL CAPACITY) FOR EXISTING BRIDGES TO REMAIN IN PLACE (H)
0 TO 100	18	HL-93	H-15
101 TO 400	20	HL-93	H-15

GENERAL NOTES

(1) THIS STANDARD DRAWING IS INTENDED TO BE USED FOR THE DESIGN OF LOW-VOLUME ROADWAYS CLASSIFIED AS LOCAL ROADS. FOR ADDITIONAL GUIDANCE NOT COVERED ON THIS SHEET, REFERENCE SHOULD BE MADE TO AASHTO "GUIDELINES FOR GEOMETRIC DESIGN OF LOW-VOLUME ROADS," (2019).

(2) PROJECTS WITH DESIGN SPEEDS GREATER THAN 40 MPH SHALL USE STANDARD DRAWING RD11-TS-1A.

(3) FOR INTERSECTION SIGHT DISTANCE, SEE SECTION 4.6 OF THE AASHTO "GUIDELINES FOR GEOMETRIC DESIGN OF LOW-VOLUME ROADS," (2019). FOR HIGHER ADT'S REFER TO THE RD11-SD-SERIES STANDARD DRAWINGS FOR ADDITIONAL GUIDANCE.

(4) IF NO ABOVE GROUND UTILITIES ARE INVOLVED, MINIMUM RIGHT-OF-WAY SHOULD BE THE TRAVELED WAY PLUS CLEAR ZONE.

(5) IF ABOVE GROUND UTILITIES ARE INVOLVED, MINIMUM RIGHT-OF-WAY SHOULD BE SUFFICIENT TO ACCOMMODATE THE UTILITIES OUTSIDE THE CLEAR ZONE.

(6) DESIGNER SHOULD CONSIDER ANY KNOWN SITE-SPECIFIC SAFETY PROBLEMS AND TYPICAL DAILY USE OF THE ROADWAY WHEN DETERMINING ROADWAY GEOMETRICS ON A CASE-BY-CASE BASIS. SITE-SPECIFIC SAFETY PROBLEMS MAY BE INDICATED BY CRASH DATA, SKID MARKS, ROADSIDE DAMAGE, SPEED DATA, OR CONCERNS RAISED BY LOCAL OFFICIALS, POLICE, OR LOCAL RESIDENTS.

(7) FOR EXISTING ROADS, CROSS-SECTION WIDTHS NEED NOT BE MODIFIED, EXCEPT IN THOSE CASES WHERE THERE IS KNOWN EVIDENCE OF A SITE-SPECIFIC SAFETY PROBLEM AS LONG AS THE MINIMUM CRITERIA, AS SHOWN IN TABLE I, IS MET.

(8) FOR THIS STANDARD THE FOLLOWING ARE THE POSSIBLE ROADWAY USES:

a. RURAL LOCAL ROADS SERVE A DUAL FUNCTION OF PROVIDING ACCESS TO ABUTTING PROPERTIES AS WELL AS PROVIDING THROUGH OR CONNECTING SERVICE BETWEEN OTHER LOCAL ROADS.
b. RECREATIONAL AND SCENIC ROADS SERVE SPECIALIZED LAND USES, INCLUDING PARKS, TOURIST ATTRACTIONS, AND RECREATION FACILITIES, SUCH AS CAMPSITES OR BOAT-LAUNCH RAMPS. WHEN AVAILABLE, PEAK-SEASON ADT SHOULD BE USED FOR DESIGN.
c. INDUSTRIAL OR COMMERCIAL ACCESS ROADS SERVE DEVELOPMENTS THAT MAY GENERATE A SIGNIFICANT PROPORTION OF TRUCK OR OTHER HEAVY VEHICLE TRAFFIC.
d. URBAN LOCAL ROADWAYS SERVE A DUAL FUNCTION OF PROVIDING ACCESS TO ABUTTING PROPERTIES AS WELL AS PROVIDING THROUGH OR CONNECTING SERVICE BETWEEN OTHER LOCAL ROADS.

(9) ROADWAY SURFACE TYPE SHOULD MATCH EXISTING SURFACE OR SHALL BE DETERMINED BY LOCAL GUIDELINES. WHEN EXISTING SURFACE IS ASPHALT, SEE DESIGN GUIDELINES FOR PAVEMENT DESIGN GUIDANCE.

(10) THE MINIMUM DESIRED SHOULDER WIDTH IS 2' FOR EACH SIDE OF ALL PROPOSED ROADWAYS.

❁ MINOR REVISION – FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

DESIGN STANDARDS FOR LOW-VOLUME ROADS

01-01-2019 | RD11-TS-1